JAY CLARK

WOSA/XMC MCAPI and MCSPI
DESIGN SPECIFICATION

Revision:	Second Draft
Author:	Dave Brown
Date:	Friday, July 1, 1994
Project:	MOTION.100
Project Location:	\\rgbsrvr_2\master\cmpnt
Document Name:	\doc\des\des_2\design.doc
Description:	This document describes the software design of the WOSA/XMC MCAPI/MCSPI Motion Control software component.

Revision History:	4/15/94 (DB)	- First Draft: Initial writing.
	7/1/94 (DB)	- Second Draft: Split design off small business plan, incorporated suggestions.

ROY-G-BIV Corporation Confidential

© 1994 ROY-G-BIV Corporation. All rights reserved.

ROY-G-BIV CORPORATION
EXHIBIT 2010-1
ABB v ROY-G-BIV
TRIAL IPR2013-00062

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

This is a preliminary release of the documentation. It may be changed substantially prior to final commercial release. This document is provided for discussion purposes only in strict confidence and subject to the non-disclosure agreement executed between ROY-G-BIV Corporation and Compumotor, a division of Parker Hannifin, dated May 19, 1994.

ROY-G-BIV, WOSA/XMC, MCAPI, and **MCSPI** are trademarks of ROY-G-BIV Corporation.

Microsoft, Microsoft Visual C++, Microsoft Visual Basic, WIN32, and **Microsoft Excel 5.0** are registered trademarks and **Windows, Windows NT, WIN32s, WIN32c,** and **OLE** are trademarks of Microsoft Corporation.

Borland and **Borland C++** are trademarks of Borland International, Inc.

Printed in the United States of America.

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

Table of Contents

TABLE OF CONTENTS i

1.0 OVERVIEW 1

1.1 DESIGN GOALS 1
1.2 DEFINITIONS 2
1.3 TARGET PLATFORMS 3
1.4 MAJOR CHANGE LIST 3

2.0 OVERALL DESIGN 5

2.1 INTERACTION-MAP DESCRIPTION 5
2.2 MAIN INTERACTION-MAP - LOCAL SEVER 6
2.3 MAIN INTERACTION-MAP - REMOTE SEVER [FUTURE FEATURE] 7
2.4 MODES OF OPERATION 8

3.0 SCENARIO MAPS 9

3.1 SCENARIO-MAP DESCRIPTION 9
3.2 INITIALIZATION (CORE MCAPI) 9
3.3 INITIALIZATION TUNING (CODE GENERATION MCSPI) 11
3.4 SERVO PID TUNING (EXTENDED AND EXTENDED UI MCSPI) 12
3.5 MOVING ABSOLUTE (CORE MCSPI) 13
3.6 MOVE RELATIVE USING A VISUAL BASIC APPLICATION 14
3.7 MULTI AXIS LINEAR INTERPOLATED MOVE (EXTENDED MCSPI) 15

4.0 C/C++ SUPPORT 17

4.1 C SKELETON 17
4.1.1 Initialization *17*
4.1.2 Create The Motion Control Component *17*
4.1.3 Use the Motion Control Component *18*
4.1.4 End OLE 2.0 Session *19*
4.2 C++ SKELETON [FUTURE FEATURE] 19
4.2.1 Initialization *19*
4.2.2 Create The Motion Control Component *19*
4.2.3 Use the Motion Control Component *20*
4.2.4 End OLE 2.0 Session *20*

5.0 VISUAL BASIC SUPPORT 21

5.1 OLE AUTOMATION 21
5.2 AUTOMATION EXAMPLE 21
5.3 OLE CUSTOM CONTROL [FUTURE FEATURE] 22

6.0 STANDARD OLE INTERFACES 23

6.1 ICLASSFACTORY INTERFACE 23
6.2 IDATAOBJECT INTERFACE 23
6.3 IDISPATCH INTERFACE 23
6.4 IMARSHAL INTERFACE [FUTURE FEATURE] 23
6.5 IUNKNOWN INTERFACE 24

7.0 DRIVER ADMINISTRATOR MCAPI OLE INTERFACES 25

7.1 STANDARD OLE INTERFACES 25
7.2 CUSTOM OLE INTERFACES 25

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

7.2.1 IComponentEnv *25*

8.0 MOTION CONTROL COMPONENT MCAPI OLE INTERFACES **26**

8.1 STANDARD OLE INTERFACES 26
8.2 ATTACHMENT RELATIONSHIPS 26
8.3 CUSTOM OLE INTERFACES - GENERAL 28
8.3.1 IBatch Interface [FUTURE FEATURE] *28*
8.3.2 ICounter Interface *28*
8.3.3 ICurrentState Interface *28*
8.3.4 IDisplay Interface [FUTURE FEATURE] *29*
8.3.5 IEncoder Interface *29*
8.3.6 IInterrupt Interface *30*
8.3.7 IIO Interface *30*
8.3.8 IJoystick Interface *30*
8.3.9 ILimits Interface *31*
8.3.10 IMotion Interface *31*
8.3.11 ITimer Interface *32*
8.4 CUSTOM OLE INTERFACES - CODE GENERATION 32
8.4.1 IConditional Interface *32*
8.4.2 IOperator Interface *33*
8.4.3 IProgram Interface *34*
8.4.4 IProgramMgmt Interface *34*
8.4.5 ISubroutine Interface *34*
8.4.6 IVariable Interface *35*
8.5 CUSTOM OLE INTERFACES - DIAGNOSTIC 35
8.5.1 IDebug Interface *35*

9.0 MOTION CONTROL DRIVER MCSPI OLE INTERFACES **36**

9.1 MCSPI CATAGORIES 36
9.1.1 Core MCSPI *36*
9.1.2 Extended MCSPI *36*
9.1.3 Extended UI MCSPI *37*
9.1.4 Extended Code Generation MCSPI *37*
9.1.5 Extended Vendor Specific SPI *37*
9.2 INTERFACE MAP 38
9.3 STANDARD OLE INTERFACES 38
9.4 CUSTOM OLE INTERFACES - CORE 38
9.4.1 IDrvCore_AnalogIO Interface *39*
9.4.2 IDrvCore_CurrentState Interface *39*
9.4.3 IDrvCore_DigitalIO Interface *40*
9.4.4 IDrvCore_Encoder Interface *40*
9.4.5 IDrvCore_IO Interface *40*
9.4.6 IDrvCore_Limits Interface *40*
9.4.7 IDrvCore_Motion Interface *41*
9.4.8 IDrvCore_Servo Interface *41*
9.4.9 IDrvCore_Stepper Interface *41*
9.5 CUSTOM OLE INTERFACES - EXTENDED 42
9.5.1 IDrvExt_Counter Interface *42*
9.4.2 IDrvExt_Debug Interface (Private) *42*
9.5.3 IDrvExt_Display Interface *42*
9.5.4 IDrvExt_Encoder Interface *42*
9.5.5 IDrvExt_Interrupt Interface *43*
9.5.6 IDrvExt_IO Interface *43*
9.5.7 IDrvExt_Joystick Interface *43*

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

9.5.8 IDrvExt_Limits Interface *43*
9.5.9 IDrvExt_Motion Interface *44*
9.5.10 IDrvExt_Timer Interface *44*
9.6 CUSTOM OLE INTERFACES - EXTENDED UI 45
9.6.1 IDrvExtUI_AnalogIO Interface *45*
9.6.2 IDrvExtUI_CurrentState Interface *45*
9.6.3 IDrvExtUI_DigitalIO Interface *45*
9.6.4 IDrvExtUI_Servo Interface *45*
9.7 CUSTOM OLE INTERFACES - CODE GENERATION 45
9.7.1 IDrvExtCG_Conditional Interface *46*
9.7.2 IDrvExtCG_Operator Interface *46*
9.7.3 IDrvExtCG_Program Interface *47*
9.7.4 IDrvExtCG_Subroutine Interface *47*
9.7.5 IDrvExtCG_Variable Interface *48*
9.8 CUSTOM OLE INTERFACES - VENDOR SPECIFIC 48

APPENDIX A 49

A.1 UNRESOLVED ISSUES 49
A.2 REVIEWER FEEDBACK 49
A.2.1 Correspondence *49*

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.